IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

David G. Foster, et al

THERMAL PRINTING ASSEMBLY

Serial No. 10/729,215

Filed 05 December 2003

Group Art Unit: 1774

Examiner: Bruce H. Hess

I hereby certify that this correspondence is being deposited today with the United States Postal Service as first class mail in an envelope addressed to Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Christine Tolhurst
Christine Tolhurst

June 23, 2006
Date

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Sir:

RULE 1.132 DECLARATION
OF TEH-MING KUNG

1. I, Teh-Ming Kung, am a resident of the town of Brighton, Monroe County in the State of New York. I received a Bachelor of Science degree in Chemistry in 1977 from National Cheng-Kung University, Taiwan, a Masters of Material Science from the University of Rochester in 1981, and a PhD from the University of Rochester in 1985 with a thesis on the Thermal Mechanical Properties of Amorphous Materials. I have been employed by the Eastman Kodak Company since 1985 and engaged since that time in Research and Development in electrophotography, thermal printing, and inkjet technology. I am a named inventor or co-inventor on over 50 issued United States Patents related to my research and development activities.

2. I am a named co-inventor of U.S. Serial No. 10/729,215.

3. I have read and understood the Office Action dated 1/25/2006.

4. I personally designed and oversaw or conducted the experiments necessary to produce the following tables of data.

5. A receiver element comprising different stick preventive agents and other compounds was made as follows, using the compositions of Table 4, wherein all compounds set forth in Table 4 are in percent by weight of dye image-receiving layer. These materials are also described in the Examples of the present application.

Table 4

Receiver Element	PES (polyester)	PC (polycarbonate)	DOS (dioctyl sebacate)
C-6	74.67	20	5.33
C-7	74.44	19.94	5.32
C-8	74.44	19.94	5.32
C-9	74.44	19.94	5.32
E-2	74.44	19.94	5.32
E-3	74.44	19.94	5.32
E-4	74.44	19.94	5.32
E-5	74.44	19.94	5.32

6. Stick preventive agents were obtained from Genesee Polymers Corp. The chemical composition of stick preventive agents is further described in Table 5.

Table 5

Stick Preventive Agent	Description
GP-10-100	Poly(dimethyl siloxane), Mw ~6,000
GP-10-1000	Poly(dimethyl siloxane), Mw ~28,000
GP-10-10000	Poly(dimethyl siloxane), Mw ~62,500
GP-368	Methyloctyl silicone, contains straight alkyl chain of C_8
GP-154	Methylalkyl silicone, contains straight alkyl chain of C_{12} to C_{14}
GP-70-S	Methylalkylaryl silicone, contains ~70wt% alkyl chain of C_{12} to C_{14} and ~30 wt% alkylaryl chain
GP-74	Methylalkylaryl silicone, contains ~30wt% alkyl chain of C_{12} to C_{14} and ~70 wt% alkylaryl chain

7. The receiver element was prepared by first extrusion laminating a paper core with an ~36 μm thick microvoided composite film (OPPalyte 350 K18, Exxon-Mobil Co., disclosed in U.S. Patent No. 5,244,861). The composite film side of the resulting laminate was prepared as follow:

(1) A subbing layer was prepared by dissolving a mixture of amino functionalized silane coupling agents of PCR Prosil 221(0.055 g/m^2), Prosil 2210(0.055 g/m^2) (from PCR of Gainesville, FL), and lithium chloride(0.003 g/m^2) in 3A alcohol (a mixture of 5% by volume of methanol and 95% by volume of ethanol) to make a solution of ~1% solid. Then the prepared subbing layer solution was machine-coated onto the composite film at a speed of ~12 meters per minute and dried in line at 70-95°C for approximately 3-4 minutes.

(2) A dye image-receiving layer was prepared by dissolving the dye image-receiving materials according to Table 4 in a solvent mixture of methylene chloride and trichloroethylene (80/20) to make a solution of 5% solid. Then the prepared solution was machine-coated on top of the coated subbing layer at a coating speed of ~7.6 meters per minute and dried in line at 70-95°C for approximately 5 minutes. 0.3 weight percent of stick preventive agent was added in the preparation of dye image-receiving layers DRL-5 through DRL-11 (also refer to Table 6 below), wherein the chemical composition of the stick preventive agents is further described in Table 5.

A backing layer (MLT-70, Exxon-Mobil Co.) was extrusion laminated to the side of the paper core opposite to the microvoided composite film.

8. The above prepared receiver elements C-6 through C-9 and E-2 through E-5 were paired with dye-donor element of DDL-1 described in the application specification as originally filed, pg. 22, line 12 – pg. 24, line 10, as a print assembly, and subjected to thermal printing using a Kodak 8670 PS printer.

9. An image target comprising arrays of 181 squares of color patches with multitude of hues of optical density (OD) ranging from Dmin (OD < 0.2) to Dmax (OD>2.0) was printed. Donor-receiver sticking performance was noted and

counted based on the total number of color patches of the imaged receiver element being observed to have drop-outs, total dye-donor layer transfer, spots, or other indicia of sticking as described herein. The higher the number of counts, the worse the degree of donor-receiver sticking performance.

10. The results of the testing are summarized in Table 6. The incorporation of polydimethyl siloxane of different molecular weight used in DRL-5 through DRL-7 of receiver elements C-7 through C-9 do not help reduce donor-receiver sticking and actually make the sticking even worse as compared to C-6, which does not add any stick preventive agent.

11. The addition of alkylated polydimethyl siloxane, such as, GP-368 of methyloctyl silicone in DRL-8 with contains alkylated octyl chain (C_8) in DRL-8 of receiver element E-2 and GP-154 of methyldodecyl silicone which contains alkylated dodecyl chain (C_{12}) in DRL-9 of receiver element E-3, shows obvious improvement in reducing donor-receiver sticking.

Table 6

Receiver Sample	Dye image - receiving Layer	Stick Preventive Agent	Degree of Sticking
C-6	DRL-4	no	33
C-7	DRL-5	GP-10-100	55
C-8	DRL-6	GP-10-1000	60
C-9	DRL-7	GP-10-10000	58
E-2	DRL-8	GP-368	13
E-3	DRL-9	GP-154	1
E-4	DRL-10	GP-70-S	0
E-5	DRL-11	GP-74	0

12. Furthermore, the addition of alkylated polydimethyl siloxane, such as, GP-70-S of alkylated methylalkylaryl silicone with alkylated chain of C_{12} to C_{14} carbons in DRL-10 of receiver elements E-4 and GP-74 of alkylated

methylalkylaryl silicone with alkylated chain of C_{12} to C_{14} carbons in DRL-11 of receiver elements E-5 demonstrates a total elimination of donor-receiver sticking.

13. The sticking data in Table 6 indicate that the addition of conventionally regarded stick preventive agents, such as, polydimethyl siloxane of various molecular weights (GP-10-100, GP-10-1000, GP-10-10000), does not help reduce donor-receiving sticking problem.

14. Increasing the alkyl chain length of alkylated polydimethyl siloxane to C_8 carbons or greater, such as, GP-368 and GP-154, shows substantial improvement in reducing donor-receiver sticking.

15. A total elimination of donor-receiver sticking can be achieved when alkylated polydimethyl siloxane comprises additional molecular composition of alkylaryl siloxane, such as, GP-70-S and GP-74, which are added in DRL- 10 of receiver element E-4 and in DRL-11 of receiver element E-5, respectively.

16. I declare further that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

June 23, 2006 — Date

Teh-Ming Kung — Teh-Ming Kung

86993ALMB
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Teh-Ming Kung, et al

THERMAL RECEIVER

Serial No. 10/729,567

Filed 05 December 2003

Group Art Unit: 1774

Examiner: Bruce H. Hess

I hereby certify that this correspondence is being deposited today with the United States Postal Service as first class mail in an envelope addressed to Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Christine Tolhurst
Christine Tolhurst

December 29, 2005
Date

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Sir:

EXPRESS ABANDONMENT

Applicant expressly abandons the above-identified application, but not the invention contained therein.

Respectfully submitted,

Lynne M. Blank
Attorney for Applicant(s)
Registration No. 42,334

Lynne M. Blank/ct
Rochester, NY 14650
Telephone: 585-477-7418
Facsimile: 585-477-1148

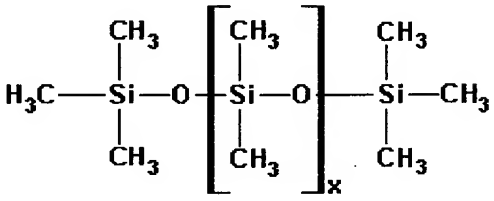
If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Attachment #1 USSN 10/729,215

DIMETHYL SILICONE FLUIDS

Back to Main Literature Page

Dimethyl Silicone Fluids have the following general structure:



Chemical inertness, non-corrosivity, thermal stability, lubricity and extreme low levels of toxicity make dimethyl silicone fluids the product of choice for many diverse applications. They are among the most versatile, cost-effective materials used for release agents, lubricants and polishes.

Genesee Polymers manufactures dimethyl silicone fluids that range in viscosity from 5 to 60,000 cstks. These are designated GP-10-X where X is the viscosity of the fluid in centistokes (cstks.). The following selection table shows the GP-10 products for which emulsified versions are currently being offered. Other viscosity dimethyl silicone fluids and emulsions are available upon request.

Product	Viscosity (cstks.)	M.W. (ave.)	Standard 50% Emulsion
GP-10-100	100	6,000	GP-51-E
GP-10-350	350	13,500	GP-52-E
GP-10-1,000	1,000	28,000	GP-53-E
GP-10-10,000	10,000	62,500	GP-54-E

Back to top